

Case Report

A case of papillary thyroid cancer with soft tissue metastasis

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ABSTRACT

Papillary thyroid cancer is the most common thyroid malignancy, and although metastatic spread is typically confined to regional lymph nodes, there are rare documented cases of distant spread of disease. Distant metastases of differentiated thyroid cancer are unusual; lung and bones are the most frequently affected sites. Soft tissue metastases are extremely rare. Here we present an unusual case of soft tissue metastasis of papillary thyroid cancer to skeletal muscle. Soft tissue metastasis is rarely seen in differentiated thyroid carcinoma. Differentiated thyroid carcinoma, although generally clinically indolent, may occasionally develop distant metastases and even manifest itself as a metastatic tumour.

Keywords: Arm swelling, Papillary thyroid cancer, Soft tissue metastasis

INTRODUCTION

Differentiated thyroid cancer is characterized by excellent prognosis and long-term survival. Metastases occur in about 5%-10% of patients.¹ Distant metastases from thyroid cancer are more commonly associated with the follicular histologic type because of its tendency to spread haematogenously. When present, 50% of cases of metastatic papillary thyroid cancer at presentation are to the lung, whereas 24% are to bone.²

Less common sites of distant metastases include the brain, liver, kidney, and ovaries.^{3,4} Extra-thyroidal extension into the soft tissue can occur, but distant soft tissue and skeletal muscle metastases are rare.⁵

Soft tissues comprise over 40%-50% of the total body weight; however, haematogenous metastases to these areas are uncommon. It has been hypothesized that muscle and subcutaneous soft tissue are hostile environments for the survival of cancer cells. Metastases

to soft tissue are rare and can be easily misdiagnosed histologically for a primary soft-tissue sarcoma.⁶

A literature search on the PubMed database yielded few reports of metastatic papillary thyroid cancer to skeletal muscle or soft tissue, with documented cases of symptomatic solitary metastases to the trapezius, biceps, and vastus medialis muscles.⁷⁻⁹

There are additional reports of soft tissue metastases discovered on PET-CT in the setting of widespread disseminated disease and found incidentally on routine follow-up.¹⁰ Here, we present an unusual case of metastatic papillary thyroid cancer to the subcutaneous tissue and muscle of the right arm.

CASE REPORT

A 71-year-old male patient with no known co-morbidities presented with an asymptomatic swelling on the outer aspect of right arm of 5 year's duration which was

progressively enlarging over the past 1 year. His past history was uneventful except for a hemi thyroidectomy done 15 years back (details not available).

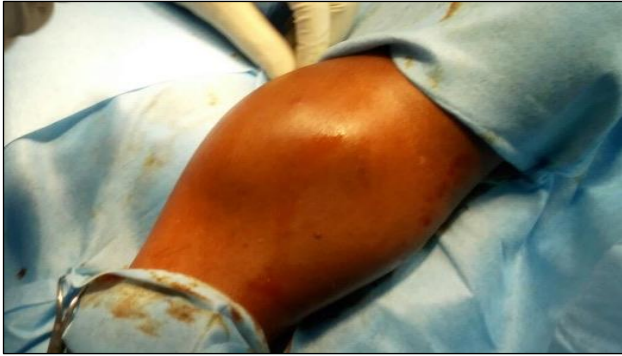


Figure 1: Swelling in the right arm.

Examination showed a 10x10 cm well circumscribed, non-tender swelling without surface changes in the intramuscular plane and with restricted mobility in the right arm. There was no distal neurovascular deficit. There was no generalized lymphadenopathy and systemic examination was within normal limits (Figure 1).

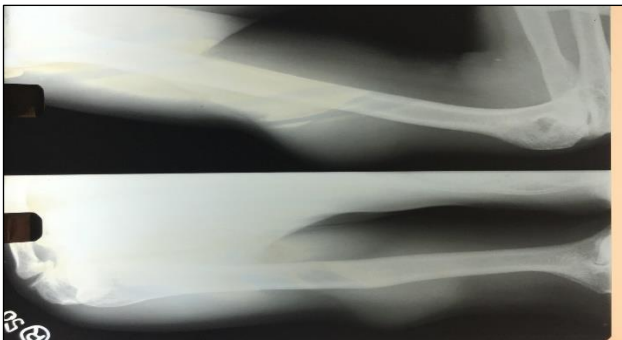


Figure 2: X-ray right upper limb showing soft tissue opacity with normal humerus.

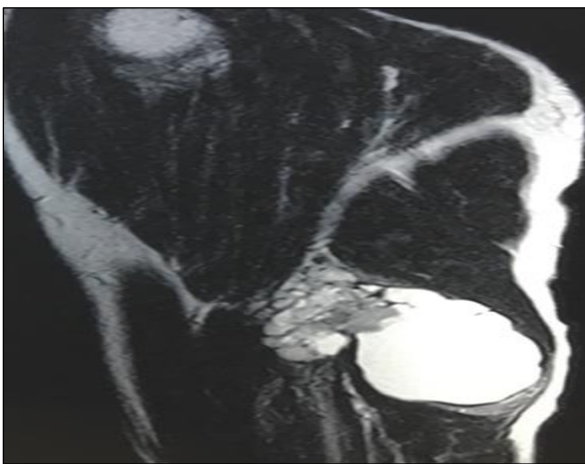


Figure 3: MRI right upper limb showing a moderately large, space occupying lesion within the lateral head of triceps muscle.

X-ray of right upper limb showed a soft tissue opacity without bony involvement (Figure 2). MRI scan confirmed a multi-loculated cystic lesion in the lateral head of triceps with extension to intermuscular plane and normal neurovascular component.

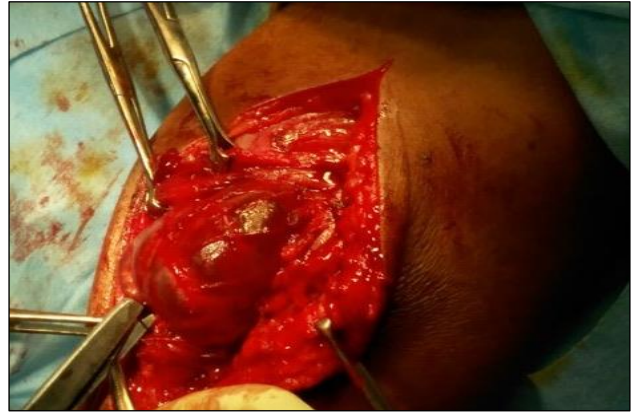


Figure 4: Intraoperative image showing a multi-loculated cystic swelling with solid areas in intramuscular plane.

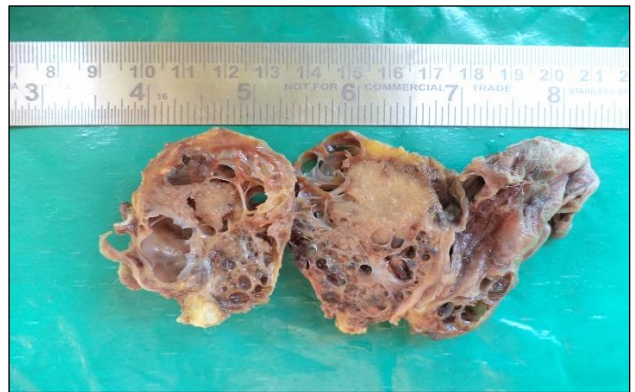


Figure 5: Gross specimen-cut section showing solid and cystic spaces.

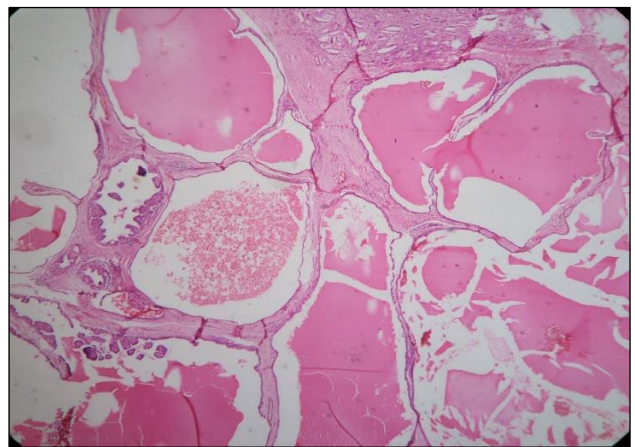


Figure 6: Hematoxylin and Eosin stained section of the tumor-Low Power (10X) showing colloid in cystic spaces.

Based on imaging features a differential diagnosis of cystic (myxoid) mesenchymal neoplasm or cystic neurogenic tumour was made (Figure 3).

Trucut biopsy gave only fragments of fibromuscular tissue. Routine investigations, including thyroid function test were normal. We proceeded with a working diagnosis of soft tissue tumour. The swelling was excised under general anaesthesia and specimen sent for histopathological examination. Intraoperatively, the swelling was found to be mostly cystic with some solid areas in the intramuscular plane, with no neurovascular involvement (Figure 4).

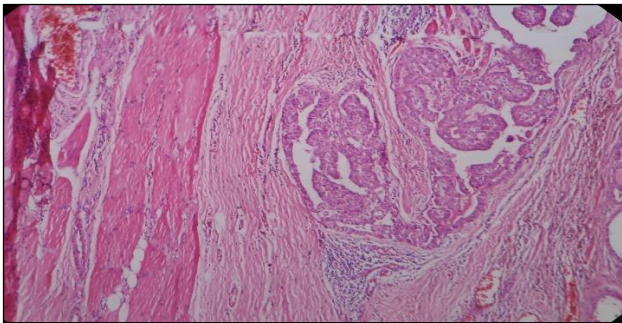


Figure 7: Hematoxylin and Eosin stained section of the tumor-Low Power (10X) showing tumor and muscle.

Cut section of the specimen showed solid and cystic areas (Figure 5).

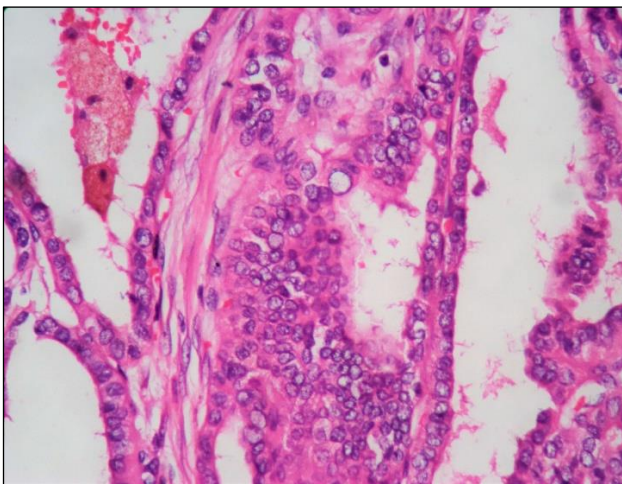


Figure 8: Hematoxylin and Eosin stained section of the tumor-High power view (40X) showing Orphan Annie nucleus.

On microscopic examination there were cystic spaces with colloid in some areas (Figure 6) and areas of tumorous proliferation (Figure 7) of cells with 'orphan Annie' nucleus (Figure 8) along with some muscle fibres.

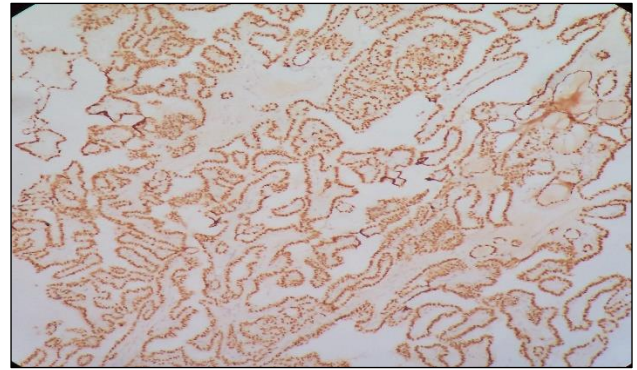


Figure 9: Immunohistochemistry showing TTF1(Thyroid transcription factor) positivity.

Immunohistochemistry showed positivity to TTF-1 (Thyroid transcription factor) (Figure 9) and thyroglobulin (Figure 10). Histopathological analysis identified the swelling to be metastatic papillary carcinoma of the thyroid.

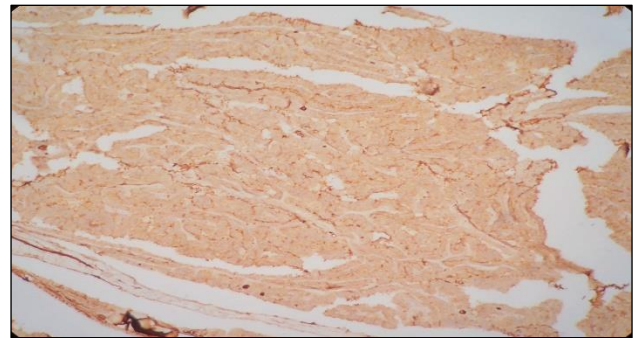


Figure 10: Immunohistochemistry showing Thyroglobulin positivity.

Patient was followed up with a radionuclide scan which showed thyrocyte uptake in mildly enlarged right lobe of thyroid. He underwent a completion thyroidectomy followed by radioiodine ablation

DISCUSSION

Papillary thyroid cancer is the most common malignancy of the thyroid gland. It typically spreads via lymphatic extension. The rate of regional papillary thyroid cancer metastasis to the neck is relatively high, while metastases outside the deep cervical chain are rare.

Distant metastases are found in only 1% of patients with papillary thyroid cancer at the time of surgery; the two most common sites are the lung and bone.¹¹

Metastatic disease in papillary thyroid cancer has a more favourable course compared to other thyroid malignancies, with a 10-year survival rate of 50%.¹⁰

Prior case reports have described solitary, symptomatic skeletal muscle metastases to the biceps, trapezius, and vastus medialis muscles.⁷⁻⁹

Histological vascular invasion, hyper-vascularity and increased blood flow in the hyper-functioning thyroid gland might have facilitated the dissemination of malignant tumour cells through the bloodstream.⁷

Here, we present a case of soft tissue metastasis from papillary thyroid cancer to skeletal muscle of the right arm. Metastases to unusual sites such as the soft tissue often occur years after initial presentation and can be associated with dedifferentiation.¹²

As in this case, where he presented with a swelling in the arm 15 years after a hemi-thyroidectomy. When soft tissue masses are identified, it is important to establish histology, as primary cancers of the lung, kidney, and colon are the most commonly reported malignancies with soft tissue metastases.⁶

The usual histological feature of papillary thyroid carcinoma is a branching, tree-like pattern formed by a papilliform fibrovascular stroma, lined by epithelial cells that have crowded oval nuclei containing distinctive "ground glass" chromatin or "Orphan Annie" eyes.¹³

Calcified clumps of cells, known as psammoma bodies, are diagnostic of papillary thyroid carcinoma; however, they are observed in only about 25% of cases.¹⁴ Immunohistochemical use of a panel of antibodies to TTF-1 and thyroglobulin confirm the thyroidal origin of neoplasms.¹⁵

This case emphasizes that papillary thyroid carcinoma, while typically following an indolent course, can result in distant metastases to unusual locations like the soft tissue. Physicians should be aware of the possibility of metastases of papillary thyroid cancer to any location, even after successful resection and treatment of the primary tumour.

CONCLUSION

This report highlights an unusual case of metastatic papillary thyroid carcinoma spread to the soft tissue of the arm in the presence of recurrent disease.

The practical interest in this case is that differentiated thyroid carcinoma, although generally clinically indolent, may occasionally develop distant metastases and even manifest itself as a metastatic tumour.

One should be aware of the possibility of metastases to any location during follow-up of patients who have undergone resection of the primary tumour, especially in elderly patients and those with aggressive primary tumours.

Aggressive surgical approach on the primary and secondary tumours followed by radioiodine ablation is the treatment of choice for thyroid tumours with soft tissue metastasis.

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Ethical approval: Not required

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